

The complications not directly connected with the lung were: Pericarditis, 22 cases; phlebitis, 6 cases; meningitis, 3 cases; joint disease, 1 case; neuritis, 2 cases.

These complications probably fall considerably short of the actual total, for they include only the clinical diagnosis, the autopsy records not having been included in the analysis.

SURGERY.

UNDER THE CHARGE OF

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Simple Fractures of the Upper End of the Radius.—PRAT (*Revue d'Orthopedie*, March 1, 1906) says that it is astonishing how fracture of the upper end of the radius has passed without recognition, and how rare and brief are the descriptions of it in the books. He refers to about twenty cases from the literature, and reports four new cases. His conclusions concerning this fracture are based upon a study of the literature and his own cases.

The etiology, he says, requires no special mention. The usual cause is a fall on the hand, the force being received by the thenar side of the palm. Exceptionally the fracture may be due to direct violence, especially when applied to the posterior surface of the head, which is superficial. Quoting Tixier, he says that very rarely fracture of the neck may be due to violent contraction of the biceps muscle, the head being resisted by the annular ligament above. In the absence of any ligamentous attachment to the head or neck of the radius, fracture by the tearing of a ligament cannot occur.

Most frequently the head or neck is broken by a bending or crushing effect, the radius being caught between the humerus and the ground. The head does not continue the axis of the shaft, but forms an angle with it opening externally, so that a bending effect is produced in a fall on the hand. When this flexion does not occur the head receives the whole force and is crushed by the humeral condyle. The results of experimental fractures here, as in other parts of the body, are not convincing.

These fractures are divided into those which are complicated by other lesions of the elbow, and those which are uncomplicated. Fractures of the head are usually due to a crushing force, the lines of fracture being vertical or oblique. They are always intra-articular, making possible all the sequels consecutive to hemarthrosis. When a fragment of the head is rendered movable, it may become an intra-articular foreign body.

Fractures of the neck, when not due to an extension of a fracture of the head, are transverse or oblique. Prat believes that these are the cases due to a bending of the head downward. The horizontal line of fracture may be incomplete in some cases, that is, it may involve only a part of the thickness of the bone; in others, it may be complete and cause a decapitation. As a general rule the upper fragment is displaced backward and outward so as to lose contact with the inferior fragment, which is pulled upward and forward by the pull of the biceps. Sometimes there is a corresponding injury of the humeral condyle.

The symptoms will vary according to the type of fracture. In a simple fissured fracture the diagnosis will be confused with that of a sprain or contusion. The most characteristic sign will be the fixed and limited pain over the radial head, which rotates normally under the finger. In fracture of the neck with displacement, the symptomatology is more striking. When the fracture is complicated by neighboring fractures or dislocations, it may pass unrecognized. The skiagram, alone, can be positive in all cases. In fractures of the neck crepitus can be completely absent when the fragments are no longer in contact with each other, but the characteristic displacement will be present. This type may be confused with a luxation of the radius, the most characteristic differential sign being the rotation of the radial head in luxation, and its absence in fracture.

In simple fissured fractures without displacement, the prognosis is good for a full and rapid re-establishment of function, although the reactionary thickening may lead to future limitation of motion. The prognosis is grave in the fractures with displacement abandoned to a spontaneous cure. Consolidation of the fragments occurs in a vicious position. They may unite with the coronoid process, produce exuberant osteophytes, lead to false union, or to foreign bodies in the joint.

Prat says that a simple fissured fracture should not be immobilized. When there is a displacement of the upper fragment, its reduction is frequently impossible and when accomplished it is maintained with difficulty, so that there is only one recourse, excision of the head. This should not be done until the acute symptoms following the fracture have subsided, since the parts are then too sensitive to infection. The functional results were good in one case operated on, and in a second the patient was not seen after the twelfth day, when he was discharged with the wound cicatrized. Skiagrams later showed that some regeneration of the head had occurred in the first case.

Thomas (*Univ. Penna. Med. Bull.*, September-October, 1905) published a paper on this subject, in which he reported forty-eight cases from the literature, five new cases, and fifty-five from skiagraphic collections in Philadelphia, his own cases, however, being included in the latter. He produced on the cadaver, in five specimens, what he believes to be the typical vertical fracture of the radial head, by the same kind of force which is probably responsible for it in life, failing only in one attempt, and in that the occurrence of a fracture of the lower end of the radius was responsible for the failure.

His conclusions as to the mechanism, symptomatology, diagnosis and prognosis agree, in the main, with those of Prat. The latter, however, while calling attention to the remarkable frequency with which the fracture has passed unrecognized, throws no light on the

actual frequency of the fracture. Thomas has produced statistics which tend to show that it is as frequent as fractures of the patella. The axis of the head and neck can hardly be said to be at an angle with each other, as Prat says, since the upper cup-shaped surface of the head is at right angles with the axis of the shaft. One portion of the circumference of the head, however, is more prominent than the rest, and it is that portion which usually receives the brunt of the force in a fall on the hand, since it is anterior in pronation, and in extension of the elbow the humeral condyle is in contact only with the anterior portion of the radial cup. Prat has not recognized this fact, which was pointed out by v. Bruns, in 1881. It is just this portion of the head which is broken off in the usual vertical fracture of the head, and driven toward the palm in transverse fractures of the neck, according to Thomas' investigations.

The most confusing feature associated with this fracture is the change in position of the fragment or fragments by rotation of the forearm, the head normally rotating to the extent of about 180 degrees. When Prat says that, as a general rule, the displacement of the upper fragment is posteriorly and externally, without describing the position of the forearm, the statement has little meaning.

Those cases in which the absence of crepitus is due to so great a pull of the biceps on the lower fragment that the fractured surfaces are no longer in contact, are probably much more rare than Prat states. Some impaction is probably associated with the bending of which he speaks, in many cases, as it is in fracture at the lower end of this bone, and from the same cause. In two of Thomas' cases it was evidently present, and in Mütter's probably so. It would account for the difficulty in reducing the deformity and for the absence of crepitus. In view of the excellent results which followed non-operative treatment in one of Thomas' cases, and practically no treatment at all in the other, this being examined long after it was well, the statement that fractures of the neck with displacement of the upper fragment, which is probably always present, indicates an excision of this fragment in every case, can hardly be considered good surgery. Such a rule would very likely lead to many unnecessary infections of the elbow-joint.

Prat has very little to say of the vertical fractures of the head, which are probably much more frequent than the transverse fractures of the neck. His statement that the skiagram is always to be relied on for the diagnosis of these fractures, will not hold true in this type. Thomas reported one case in which a lateral view showed the fracture distinctly, while the anteroposterior gave no sign of it, although both skiagrams were equally clear. The frequent close approximation of the fragments by the orbicular ligament, the difficulty in determining the line of fracture, and the frequency of obscure shadows, present difficulties that are not to be overcome without great care.—J. W. W.

The Technique of Gastrojejunostomy.—MAYO (*Annals of Surgery*, April, 1906) states that the results of this operation depend more upon the condition of the patient when operated on than on the technical difficulties of the operation. The serious cases of acute "vicious circle" occurring during the first week, have practically disappeared with the evolution of better methods. The most common subsequent complication is the chronic regurgitation of bile, which comes on at